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LESSONS FOR THE FUTURE FROM THE RECENT OUTBREAKS OF FOOT-AND-MOUTH DISEASE IN EUROPE



Foot-and-mouth disease in Europe; then and now:
While western Europe became free of rinderpest during the last century and contagious bovine pleuropneumonia was stamped out in almost all countries around the turn of the century (and thereafter was completely eradicated from Europe), the control of foot-and-mouth disease has become the major problem of animal health authorities. Until about 10 years ago foot-and-mouth disease was more or less enzootic

in most European countries, and from time to time raged epizootically throughout the continent, causing enormous direct and indirect economic losses. The number of outbreaks was seldom below 20,000 a year, and during epizootic waves there were several hundreds of thousands of infected farms.

As a result of energetic control measures using classical veterinary control methods, often including the stamping-out procedure, certain countries achieved some success in reducing losses, and this was greatly improved upon by the development and introduction of preventive vaccination. However, decisive progress toward eradication was achieved only after tireless efforts of the European Commission for the Control of Foot-and-Mouth Disease had resulted in more uniform measures, and particularly after various countries in which the infection had been enzootic introduced general preventive vaccination. This is illustrated in Table 1, which shows the cases notified over the past 5 years. In comparison with the period before 1965, not only has the number of outbreaks dropped, but many countries report none or only sporadic cases.

During 1969-73, therefore, the foot-and-mouth disease situation in Europe may generally be described as having been highly favorable. Moreover, except in a few marginal regions, only the three conventional O, A, and C types of foot-and-mouth virus have appeared.

Appearance of the disease in 1972, and 1973: The apparently favorable situation is, however, deceptive and the danger has by no means been removed. The incidence recorded in 1972, and 1973, shows very clearly that major epizootic waves of the disease with all their economic consequences can only be prevented by the greatest vigilance and by rigorous application of control measures. In

these 2 years the outbreaks described below not only imperiled the livestock of the countries concerned, but also threatened the whole continent. If these outbreaks had been caused by exotic types and subtypes, and if they had not been brought under control in time, the consequences might have been disastrous.

Table 1. Outbreaks of Foot-and-Mouth Disease in Europe, (1) 1969-73

	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Number of outbreaks in Europe	1,001	767	1,635	643	2,892
Countries with:					
no outbreaks	14	18	17	17	16
1 - 10 outbreaks	7	5	6	2	6
11 - 100 outbreaks	2	1	2	6	2
over 100 outbreaks	4	3	2	2	3

(1) Excluding the U.S.S.R. and Turkey

In the last months of 1972, foot-and-mouth disease caused by type C virus spread throughout the southeast European countries of Hungary, Romania, and Yugoslavia, and also filtered into Czechoslovakia and Austria. It affected mainly pigs and the course of the disease was only arrested by the rigorous application, over large areas in the countries concerned, of protective measures covering all susceptible animal species. Toward the end of this epizootic wave - early in 1973 - outbreaks due to type O virus were also reported in the same areas. During the first few months of 1973, Austria experienced two epizootics in a short space of time. The first came from nearby contaminated countries and caused a number of type C foci, but it was possible to eliminate it quickly. Then came a new epizootic caused by the O virus; in some regions the infection spread extensively, affecting more than 1,650 farms, and was not completely eliminated until August. Strict measures made it possible to protect other regions of the country and other countries from contamination.

Spain, which in 1972, introduced general preventive vaccination to combat the enzootic nature of foot-and-mouth disease throughout the country, experienced an epizootic in October 1972, which was alarming because it was due to a subtype of virus A that was new to Europe. As the trivalent OAC vaccine used provided insufficient protection against this subtype, the new strain had to be incorporated in the vaccine. In this instance, also, it was possible to eliminate the infections fairly quickly. In the spring of 1972, the appearance in Turkish Thrace and in Greece of foot-and-mouth disease caused by the A22 subtype, exotic to Europe, alarmed not only the veterinary authorities of the affected countries, but also those of neighboring and other European countries, and the international organizations concerned, i.e., FAO, FAO's European Commission for the Control of Foot-and-Mouth Disease, and the International Office of Epizootics (OIE). The outbreak came as a surprise because livestock in Turkish Thrace (which is a buffer zone for the protection of Europe) had been covered by vaccination since the great epizootic of A22 in 1964. The disease, which had reached serious proportions in some regions of Greece, was eventually eliminated with the support of the international organizations.

However, in the following year (1973) a number of outbreaks occurred again in

Greece, some of which became very serious; most of these cases were caused by a subtype of virus O. In the summer of 1973, the appearance of the Asia-1 virus started a general alert in Turkey. Outbreaks of Asia-1 infection had already been reported in Iran in the spring. Despite the defensive measures taken by the Turkish Veterinary Service, the disease overflowed into Turkish territory and in a few weeks crossed the whole country, causing a number of foci even in the Istanbul region, on the European continent. There appeared to be a repetition of what had occurred in 1962, when SAT 1 appeared and again in 1964, when A22 came on the scene.

The task was once more to protect the whole of Europe against invasion by this exotic type of foot-and-mouth disease, which would have had immeasurable economic effects on European agriculture. With the support of the international organizations concerned (FAO, its European Commission for the Control of Foot-and-Mouth Disease, OIE) defense measures were planned with FAO and European countries making a very substantial contribution to their implementation.

As no further cases of infection by Asia-1 have been reported in Turkey since September 26, 1973, the situation for the moment looks hopeful.

For the next few years, however, it will be necessary to retain the buffer zone set up in Thrace, in the frontier regions of Turkey, Greece, and Bulgaria, where all susceptible animals must be vaccinated against Asia-1.

Origin of the epizootics: The epizootics that appeared in Europe in 1972, and 1973, may be ascribed to several different sources of infection. The outbreaks reported in southeast Europe and in Austria were undoubtedly linked to the prior presence of the disease in those regions; in other words, generally they must be considered to have been due to already existing virus sources. This applies also to the appearance of A22 in Thrace. But the outbreaks caused by subtype A in Spain, Asia-1 in Turkey and type O in Greece were definitely connected with animal or meat imports.

These findings highlight the need to concentrate efforts on the one hand in tracing, reporting and combating the existing foci of infection in Europe, and on the other, to preventing further introductions of the infection from outside the continent, particularly from exotic strains of virus against which the vaccines manufactured and used in Europe provide no protection.

Future protection: Successful control will largely depend on timely, frank, and realistic information on the appearance of foot-and-mouth disease in areas hitherto free from it. Nowadays it is no longer sufficient for an infected country to act independently in taking the necessary steps to prevent the spread of the disease. With the present volume of traffic in animals and goods, neighboring countries must also be notified without delay about the appearance of infectious diseases so that they are able to take appropriate defensive measures if necessary. The reporting system of the International Office of Epizootics is extremely useful and works efficiently; it has, however, to rely on each country providing prompt detailed information on cases of epizootics in regions that have so far been free from such diseases, and on their evolution.

Attention must be called to the importance of regular and general preventive

vaccination of livestock. The epizootics that break out here and there in Europe, especially in areas of former enzootic infection, show that there are still virus sources which will eventually cause epizootic waves. In countries where livestock receive general preventive vaccination against foot-and-mouth disease, the animals possess a basic immunity which, with revaccination, can be immediately raised to its maximum level through the booster effect. In this way, if an outbreak occurs it cannot attain large proportions involving hundreds of foci. Experience also shows that in countries where general vaccination of cattle is regularly applied the foot-and-mouth virus does not become adapted to pigs, and this reduces the chance of an epizootic wave developing in those animals.

It is therefore extremely important to continue general preventive vaccination against foot-and-mouth disease, at least in the countries where this has been the practice so far, even if it involves heavy expenditure. If sporadic cases arise in such regions, the stamping-out method must be adopted to ensure that no new source of virus is created - in the form of latent carriers, for example.

The introduction of foot-and-mouth disease into Europe from other countries must be expected in the future. The main reason for this is that many countries have to import large quantities of meat to satisfy their needs. Unfortunately, it is not possible to import meat only from countries free from foot-and-mouth disease, as would be desirable. It should be noted that the European Commission for the Control of Foot-and-Mouth Disease has made recommendations concerning the import of meat from countries not free from foot-and-mouth disease, and the example of the United Kingdom shows that a country can be kept free from the disease despite massive imports, if the appropriate regulations are observed.

The case of Switzerland may also be mentioned: In the 10 years before 1966, an average of 100 foci of disease occurred per year; many of those foci were attributable to feeding pigs on garbage from butchers' shops, hotels, etc. Since 1966, all cattle in Switzerland have been subjected to preventive vaccination every year against foot-and-mouth disease, and the regulations concerning the importing of meat have been made more and more restrictive; as a result, only one outbreak of foot-and-mouth disease has occurred, involving 22 herds, and this was related to meat imports.

What is still lacking is a more coordinated policy among European countries on imports. Every country should be aware that import control helps to protect not only its own livestock, but also that of the whole continent. While meat imports have obviously to receive priority attention, care should also be taken with animals, particularly those coming from countries where viruses exotic to Europe occur, i.e., strains against which the usual European vaccine are ineffective. FAO and OIE have drawn up recommendations concerning imports from such countries.

If an exotic type of foot-and-mouth disease makes its appearance in Europe or adjacent regions, the procurement of vaccine becomes a problem of first importance. It must be possible to obtain the necessary quantities of vaccine in the shortest possible time, because the sooner preventive vaccination can begin the more effectively can control operations be carried out.

While Europe has institutes capable of producing large quantities of foot-and-

mouth vaccine. OIE recommendations permit them to deal with viruses appearing in Europe only. Their production capacity cannot therefore be drawn on except when the exotic infection has already been demonstrated. This entails the danger that the disease may have spread significantly before the specific vaccines can be manufactured and become available for use. These difficulties were encountered during the outbreak of A22 in Greece and Turkey in 1972, and again in 1973 when type Asia-1 appeared in Turkey. All resources, particularly those of FAO, had to be mobilized to get together sufficient vaccine in a reasonable time.

To protect themselves against such a situation, the EEC countries have established stocks of exotic vaccines which are stored outside Europe. As the potency of foot-and-mouth vaccine is of limited duration, this is a temporary and expensive expedient which not all countries can afford. It would be much more useful to set up, in the areas where the virus strains are endemic, foot-and-mouth vaccine-producing institutes of high capacity which could supply other countries with sufficient vaccine if the need arose.

There are very few of these institutes at present, probably because the control of foot-and-mouth disease in the developing countries is not considered to be one of the most urgent problems of indigenous agriculture. In the interests of meat production, and possibly also of meat exports, the developing countries must devote greater attention in future to the control of this epizootic. In countries where foot-and-mouth disease is enzootic, general preventive vaccination of livestock must be undertaken as a first step. This will increase the demand for locally produced vaccines, and regional institutes with facilities for large-scale production would therefore be most suitable.

(References: FAO. Reports of the Sessions of the European Commission for the Control of Foot-and-Mouth Disease, Rome, Italy. OIE. Monthly epizootic circulars 1969-1973, and statements).

(Article by A. Nabholz, Director, Office Veterinaire Federal, Berne, Switzerland. Extracted from: World Animal Review, No. 11 - 1974).

PUERTO RICO AND THE U.S. VIRGIN ISLANDS OBTAIN HOG CHOLERA FREE STATUS

The Commonwealth of Puerto Rico was officially restored to "hog cholera free" status on December 18, 1974, and in a companion action, the U.S. Virgin Islands was granted such status for the first time.

All 50 States plus Puerto Rico and the nearby Virgin Islands are now recognized as "hog cholera free." Because of the persistent nature of hog cholera virus though, at least 18 months must pass from the time of the last outbreak, without any new infection, before the disease can be officially declared eradicated.

The last case of hog cholera in the Continental limits of the United States occurred in Mississippi in February 1974. The last case of the disease in Puerto Rico occurred in May 1974.

Commonwealth as well as State and Federal animal health officials are continuing their surveillance activities to detect any residual hog cholera infection.

Puerto Rico was first designated "hog cholera free" on March 24, 1974, after

going 12 months with no confirmed cases and by fulfilling other program requirements. It lost the designation in May when new infection was disclosed. Under U.S. Department of Agriculture regulations, the "hog cholera free" designation may be regained after 6 months with no further infection.

The Virgin Islands was not previously designated "hog cholera free" because the territory was not officially participating in the national eradication program. However, routine investigations as well as a special survey disclosed no infection in the territory's swine population since the national eradication program began. The last hog cholera case in the Virgin Islands was recorded in 1941.

CHANGE IN IMPORT RULES FOR CANADIAN SHEEP AND GOATS PROPOSED

The U.S. Department of Agriculture has proposed dropping a requirement that Canadian sheep and goats exported to the United States for immediate slaughter be inspected by a veterinarian before shipment from the farm of origin.

The proposal would change no other regulations or safeguards against the spread of livestock diseases when animals are imported. Sheep and goats consigned to slaughter would still have to be inspected and certified by Canadian veterinary authorities as free of communicable disease or exposure thereto.

Any sheep or goats imported without the on-farm inspection would have to be slaughtered within 2 weeks after entering the United States.

Sheep and goats imported for other purposes would still have to be inspected and certified free of disease at the farm of origin. This regulation, now in force, is designed to stop the introduction of communicable diseases of sheep and goats, including scrapie, a slow acting degenerative disease that may spread to other animals and may take 3 years to show obvious symptoms.

Both Canada and the United States have on-going scrapie eradication programs. Veterinary officials in the two countries maintain surveillance, destroy infected flocks, and trace the distribution of sheep from infected premises. Long quarantines and bloodline investigations are required for sheep imported from scrapie-infected countries, except from countries that have scrapie eradication programs comparable to the United States.

EMERGENCY PROGRAMS SUPPORT ABILITIES

It has always been a goal of Emergency Programs at the Hyattsville headquarters to support task force operations in whatever way possible.

One such way has been the development of an index known as the "County Profile Data Sheet." After the location of an index case of a disease, one of the first questions asked by both administrators and technical personnel concerns animals. One would want to know how many animals, what species, and how they are normally used and sold in the affected area. The "County Profile Data" is partially complete with the intent that these questions can be generally answered. It currently has approximately 50,000 entries organized by county.

The current content of the County Profile is complete for animal census by species, livestock markets, quarantined feedlots, rendering plants, slaughter plants, cold storage warehouses, and processing and boning facilities. It is anticipated that the "Profile" will soon contain fluid milk plants, milk processing plants, artificial inseminators, zoos, diagnostic laboratories, and the location of regulatory and private veterinary care delivery services. Further provisions are for this data to be updated every 5 years. Old "Profiles" will be maintained in order to develop trends in hopes that the future will follow historical patterns.

With this type of information, administrators are in a better position to forecast personnel needs and approximate costs. Alternate plans can be more objectively evaluated. Technical personnel will have details for baseline information. Routes of trade should be more easily identified so that surveillance and disease control actions could be used to minimize program costs and to maximize efforts to stop the disease.

Along with this method of support is a map-making system, previously reported. A problem frequently encountered has been the finite location of premises for regulatory action. Such actions may be the placement or release of quarantines.

It is now possible to make a map, send a selected area on the telecopier to the field, locate a point, and then resubmit the map via telecopier to Hyattsville for necessary action.

Maps are currently available for virtually all United States counties as produced by the various state highway departments. Also available are United States Department of Interior Geological Survey Maps for the entire country at the 1:250,000 scale plus the geodetic series in 7 and 15 minute scales. All maps are microfilmed and stored in one multidrawer filing cabinet. This storage technique has greatly reduced the storage space needed for this information.

WORLD DISEASE REPORTS*

Country	Date 1974	New Outbreaks	Country	Date 1974	New Outbreaks
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Foot-and-Mouth Disease

Argentina	July-August	206	Rhodesia	August	1
Egypt	September 1-15	1	Spain	May-June	10
Germany	September	4	Thailand	June	10**
Ghana	August	12	Togo	June	3
Hong Kong	September	1	Venezuela	June-July	8
India	May	22	Uruguay	September 1-20	7
Mozambique	May-June	1	Yugoslavia	September 1-15	4
Paraguay	April-May	20			

Rinderpest

India	May	3
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Contagious Bovine Pleuropneumonia

Ghana	August	5	India	May	28
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Lumpy Skin Disease

Madagascar	March	5
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Sheep Pox

Greece	July	55	Morocco	August	31
India	May	4	Tunisia	August	3

Dourine

South Africa	August	2
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African Swine Fever

Portugal	August 16- September 15	11	Spain	September 1-15	7
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Teschen Disease

Madagascar	March	6
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(*Extracted from International Office of Epizootics Monthly Circular No. 334).
(**Cases).